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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,398

09/05/2006

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EXAMINER

ARMAND, MARC ANTHONY

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/582,398	<b>Applicant(s)</b> NAKAYAMA ET AL.	
	<b>Examiner</b> MARC ARMAND	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11 and 12 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**3. Claims 1,11,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al; (Lee) USPAT 6,930,658 in view of Okabe; (Okabe) USPAT 5,555,205.**

Regarding claim 1, Lee shows in fig.1 and discloses (col.3,line 35-66), an organic light-light conversion device comprising: a light sensing unit (12) having an organic layer (122) that causes a photo-current multiplication phenomenon by light irradiation,

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and a light emitting unit (14) having a layer including an electroluminescent organic semiconductor (142) that emits light by current injection.

Lee differs from the claimed invention because he does not explicitly disclose a device having at least one of the photo-conductive organic semiconductor and the electroluminescent organic semiconductor is a polymer semiconductor and a layer including a photo-conductive organic semiconductor.

Okabe shows in fig.6, and discloses (col.7, line 25-50) a device having at least one of the photo-conductive organic semiconductor (13) is a polymer semiconductor and a layer (13) including a photo-conductive organic semiconductor.

Okabe is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Lee. Therefore, at the time the invention was made; it would have been obvious to use the teachings of Okabe to have a device having at least one of the photo-conductive organic semiconductor that is a polymer semiconductor and a layer including a photo-conductive organic semiconductor in the device of Lee because it will prevent the sensitization of the sensor by monitoring light and measuring the transmittance (col.3,line 25-40).

Regarding claim 11, Lee shows in fig.1 and discloses (col.3, line 35-66), an image intensifier characterized by comprising a plurality of an organic light-light conversion devices comprising: a light sensing unit (12) having an organic layer that causes a photo-current multiplication phenomenon by light irradiation, and a light emitting unit (14) having a layer including an electroluminescent organic semiconductor (142) that emits light by current injection.

Lee differs from the claimed invention because he does not explicitly disclose a device having at least one of the photo-conductive organic semiconductor and the electroluminescent organic semiconductor is a polymer semiconductor and a layer including a photo-conductive organic semiconductor.

Okabe shows in fig.6, and discloses (col.7, line 25-50) a device having at least one of the photo-conductive organic semiconductor (13) is a polymer semiconductor and a layer (13) including a photo-conductive organic semiconductor.

Okabe is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Lee. Therefore, at the time the invention was made; it would have been obvious to have a device having at least one of the photo-conductive organic semiconductor that is a polymer semiconductor and a layer including a photo-conductive organic semiconductor because it will prevent the sensitization of the sensor by monitoring light and measuring the transmittance (col.3,line 25-40).

Regarding claim 12, Lee shows in fig.1 and discloses (col.3, line 35-66), a light sensor characterized by comprising an organic light-light conversion device comprising: a light sensing unit (12) having a layer including an organic layer or that causes a photo-current multiplication phenomenon by light irradiation, and a light emitting unit (14) having a layer including an electroluminescent organic semiconductor (142) that emits light by current injection.

Lee differs from the claimed invention because he does not explicitly disclose a device having at least one of the photo-conductive organic semiconductor and the

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electroluminescent organic semiconductor is a polymer semiconductor, and a means to measure and output a voltage applied to both ends of the layer including the electroluminescent organic semiconductor.

Okabe shows in fig.6, and discloses (col.7, line 25-50) a device having at least one of the photo-conductive organic semiconductor (13) is a polymer semiconductor and a layer (13) including a photo-conductive organic semiconductor and a unit (4) to measure and output a voltage applied to both ends of the layer including the electroluminescent organic semiconductor.

Okabe is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Lee. Therefore, at the time the invention was made; it would have been obvious to have a device having at least one of the photo-conductive organic semiconductor that is a polymer semiconductor and a layer including a photo-conductive organic semiconductor and a unit to measure and output a voltage applied to both ends of the layer including the electroluminescent organic semiconductor because it will prevent the sensitization of the sensor by monitoring light and measuring the transmittance (col.3,line 25-40).

**4. Claims 2-4, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and Okabe as applied to claims 1, 11, 12 and further in view of Daniels; (Daniels) US 2005/0088079.**

Regarding claims 2-3, Lee in view of Okabe disclose a device having a Photo-conductive organic semiconductor (13) that is a polymer semiconductor (Okabe reference).

Lee and Okabe differ from the claimed invention because he does not explicitly disclose a device wherein the electroluminescent organic semiconductor is a polymer semiconductor.

Daniels discloses (Para 0068), a device wherein the electroluminescent organic semiconductor is a polymer semiconductor.

Daniels is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Lee and Okabe. Therefore, at the time the invention was made; it would have been obvious to have a device wherein the electroluminescent organic semiconductor is a polymer semiconductor because it will provide a device that consumes less power to operate (Para 0011-0013).

Regarding claim 4, Lee in view of Okabe and Daniels disclose a device wherein the photo-conductive organic semiconductor and the electroluminescent organic semiconductor are polymer semiconductors (Daniel and Lee references).

**5. Claim 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and Okabe as applied to claims 1, 11, 12 and further in view of Igaki et al; (Igaki) USPAT 7,026,654.**

Regarding claim 5-7, Lee and Okabe disclose a device comprising: a) a light sensing unit (12) having a layer including the photo-conductive organic semiconductor

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(122), b) a light emitting unit (14) having a layer including the electroluminescent organic semiconductor (142) placed on a different location from the light sensing unit on the same substrate (11).

Lee and Okabe differ from the claimed invention because he does not explicitly disclose a device having a conductive layer connecting the light sensing unit to the light emitting unit laid on the same substrate; a device wherein a light shielding member is provided between the light sensing unit and light emitting unit; a device where the a translucent member having a transmittance that suppresses but does not completely shield the flow of feedback light into the light sensing unit is provided between the light sensing unit and the light emitting unit.

Igaki shows in fig.12 a semiconductor device comprising: a conductive layer (14) connecting the light sensing unit to the light emitting unit laid on the same substrate; a light shielding member (16) (fig.4) (col.4, line 55-60) is provided between the light sensing unit (31) and light emitting unit (21).

Igaki is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Lee and Okabe. Therefore, at the time the invention was made; it would have been obvious to have a device having a conductive layer connecting the light sensing unit to the light emitting unit laid on the same substrate; a device wherein a light shielding member is provided between the light sensing unit and light emitting unit; a device where the a translucent member having a transmittance that suppresses but does not completely shield the flow of feedback light



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into the light sensing unit is provided between the light sensing unit and the light emitting unit because it will provide a device with a good light shielding property and reduce the cost of the device (col.2,line 40-50).

Regarding to claim 8, Lee and Okabe disclose a device having the light sensing unit (12) having a layer including the photo-conductive organic semiconductor (122) and light emitting unit (14) having a layer including the electroluminescent organic semiconductor (142).

Lee and Okabe differ from the claimed invention because he does not explicitly disclose a semiconductor device having a light sensing unit that is integrally laminated with the light emitting unit

Igaki shows in fig.12, a device having a semiconductor device having a light sensing unit (31) that is integrally laminated with the light emitting unit (21).

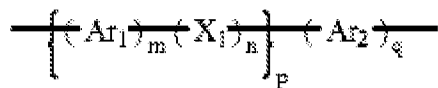
Igaki is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Lee and Okabe. Therefore, at the time the invention was made; it would have been obvious to have a semiconductor device having a light sensing unit that is integrally laminated with the light emitting unit because it will provide a device with reduce the cost of the device (col.2,line 40-50).

***Allowable Subject Matter***

7. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record neither anticipated nor

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rendered obvious all the limitation of claim 9 including a polymer semiconductor that contains one or more repeating units be the formula:



Wherein Ar.sub.1 and Ar.sub.2 each independently represent an arylene group or a divalent heterocyclic group. X.sub.1 represents --CR.sub.1.dbd.CR.sub.2--, --C.ident.C-- or --N(R.sub.3)--; R.sub.1 and R.sub.2 each independently represent a hydrogen atom, an alkyl group, an aryl group, a monovalent heterocyclic group, a carboxyl group, a substituted carboxyl group or a cyano group; R.sub.3 represents a hydrogen atom, an alkyl group, an aryl group, a monovalent heterocyclic group, an arylalkyl group or a substituted amino group. Moreover, the prior art of record neither anticipated nor rendered obvious all the limitation of claim 5 including a translucent member provided between the light sensing unit and light emitting unit.

### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1-8, 11, and 12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARC ARMAND whose telephone number is (571)272-9751. The examiner can normally be reached on 9-5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MARC ARMAND/  
Examiner, Art Unit 2814